CPU Notes

CPU – central processing unit – the primary element carrying out the computer's functions, the brain of the computer.

LGA – land grid array – a packaging technology with the pins on the socket rather than the CPU which instead has pads of bare gold-plated copper that touch the protruding pins from the socket to make contact.

IMC – integrated memory controller – integration of the memory controller onto the die of the microprocessor to reduce memory latency.

Memory latency is how long it takes to get data from RAM to the CPU, the lower the number the better.

A bus is a subsystem that transfers data between computer components or between computers.

Types of buses:
  A. The old front-side bus (FSB), which carries data between the CPU and memory controller hub
  B. The newer Quick Path Interconnect (QPI), which is a point-to-point interconnect between the CPU and the integrated memory controller. It also links processor cores to each other and the motherboard chipset thus replacing the front side bus.
  C. The newest bus, direct media interface (DMI), which is a point-to-point interconnection between an Intel integrated memory controller and an Intel I/O controller hub on the computer's motherboard.

Intel® Hyper-Threading Technology or simply Intel® HT Technology delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner. Think of it as the process of taking two lines of code (perhaps running two programs at once, multitasking) and running them through one core at the same time by efficiently blending the code. For example, if roads were hyper-threaded, two lanes of traffic could merge into one lane without causing traffic since drivers from each lane would take turns merging into the one lane.

Intel® Turbo Boost Technology dynamically increases the processor's frequency as needed by taking advantage of thermal and power headroom to give you a burst of speed when you need it, and increased energy efficiency when you don't.

A multi-core processor or CPU is an integrated circuit which has two or more individual processors called cores.

Clock speed is how fast a CPU can go from a zero to a one; rates are shown in gigahertz (GHz), which means a billion cycles per second.

Overclocking is running a CPU faster than its rated speed.

Cache is a fast storage area where the processor places data likely to be used again which is much faster than having to get the data from the system RAM.

CPU's are inserted into the socket on the motherboard.

CPU's are oriented in a LGA socket by aligning the notches on the side of the CPU with protruding keys in the socket.

A heatsink is a piece of metal that conducts heat away from the processor which is why it is often called a cooler.

Thermal Interface Material (TIM), also called heatsink compound, is a paste or thick fluid that is applied between the heatsink and the CPU to fill in any gaps between the heatsink and the CPU caused by surface imperfections. This eliminates air pockets which would insulate the heat and reduce the cooling provided by the heatsink.

A fan is attached to the heatsink to provide more cooling than what the heatsink would provide by itself.

Intel and AMD are the only two companies presently making CPU's for personal computers (PC's).

Intel 64 Architecture allows systems to use more than 4GB of RAM.

To be able to access more than 4GB of RAM you must use a 64bit operating system.

CPUID is a nice free piece of software for determining which CPU is installed in your computer. It can also show information about your motherboard, RAM, video card, etc.

Ark.intel.com is a nice section of Intel's web site for specifications and comparisons on their products including, of course, processors.